through S4 is greater than six seconds, transistor T3 stops conducting due to time lapse. Sequential switching is thus not achieved and it is not possible to energise relay RL1.

The latch-up relay circuit is built around transistors T6 through T8, zener diode ZD4, and capacitor C5.

In idle state, with relay RL1 in de-energised condition, capacitor C5 is in discharged condition and zener diode ZD4 and transistors T7, T8, and T6 in non-conduction state.

However, on correct operation of sequential switches S1 through S4, capacitor C5 is charged through resistor R9 and the voltage across it rises above 4.7 volts. Now zener diode ZD4 as well as transistors T7, T8, and T6 start conducting and relay RL1 is energised. Due to conduction of transistor T6, capacitor C5 remains in charged condition and the relay is in continuously energised condition.

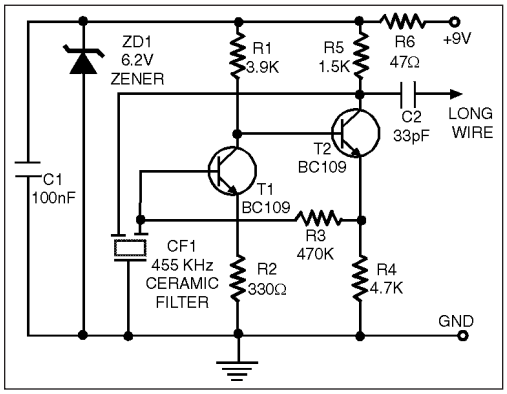
Now if you activate reset switch S5 momentarily, capacitor C5 is immediately discharged through resistor R8 and the voltage across it falls below 4.7 volts. Thus zener diode ZD4 and transistors T7, T8, and T6 stop conducting again and relay RL1 de-energises.

STABLE 455KHz BFO FOR SSB RECEPTION

D. PRABAHARAN

Most Indian amateur radio operators prefer to operate on SSB (single sideband) and CW because these carry the signal over a long distance for a given transmitter power. Broadcast receivers are not meant to directly receive Morse code transmission on SSB and CW. Short-wave listeners require some arrangement to receive the same. One such arrangement comprises a simple IF BFO (beat frequency oscillator), which is an RF oscillator of conventional type. The output of BFO is heterodyned to beat with another frequency to obtain a resultant frequency (difference of the two frequencies) lying in the audio range (about 1 kHz).

BFO can be used to get an audio note from CW reception and also to resolve SSB signals. An SSB signal is transmitted without carrier signal. In ordinary receivers, it does not produce speech with sufficient clarity. When BFO signal is heterodyned with SSB signal, this RF acts like a carrier and the signal is well resolved.



The BFO circuit comprises transistors T1 and T2, which are connected in a straightforward two-stage, direct-coupled, common-emitter configuration. The input and output are in phase and positive feedback between the two is provided by ceramic filter CF1. A significant amount of feedback is provided only at the operating frequency of the filter, which is 455 kHz. So the circuit oscillates at this frequency. The ceramic filter gives good frequency stability and requires no adjustment in order to produce the correct frequency. This BFO is meant for single-sideband reception only.

There is no need to connect BFO to receiver. Tune your BC receiver to any SSB signal, and then on keeping BFO just close to it, you may notice some hissing noise in your receiver. Match BFO frequency to your receiver's IF, which may be between 452 and 460 kHz, until you get clear sound. If the BFO signal is too strong, increase the distance between BFO and receiver.

AUTO SHUT-OFF FOR CASSETTE PLAYERS AND AMPLIFIERS

ARTHUR LOUIS

Here are two simple, low-cost circuits that can be used to shut off the mains supply to any audio or video equipment (such as tape recorder, CD player, and amplifier). These circuits are helpful to those in the habit of falling asleep with their music system on.

The circuits will also protect the equipment from getting damaged due to high-voltage spikes whenever there is a resumption of power after a break. This